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A NEW INSECT-HOST RELATIONSHIP[1]

R. A. Morse[2] and S. H. Kerr[3]

For many years, the tunneling of hymenopterous adults into the pith of cut or damaged rose stems to construct cells in which to lay eggs has been a serious problem in Florida. Insects often appear soon after roses are pruned and may begin tunneling within a half-hour. They begin at the cut end and tunnel rapidly into the pith of the stem. Rose stems which have been hollowed out may outwardly appear healthy for weeks or even months, but eventually they die back. Once micro-organisms have invaded the canes, the healthy stem tissue may be attacked, too, unless the affected area is pruned.

A complex of hymenopterous insects bores into the stems of roses, but the most commonly noted borer in the Gainesville area is *Ectemnius* (*Hypocrabro*) *texanus ais* Pate. This species was described from specimens taken in Florida over ten years ago, but not until recently was it identified as being prominent among the insects which tunnel into rose stems.

Records from the State Plant Board collection at Gainesville for *Ectemnius* (*Hypocrabro*) *texanus ais* Pate are as follows: Key West, Fla., Dec. 28, 1953, on flowers of *Flaveria linearis* Lag., H. V. Weems, Jr.; Haines City, Fla., Sept. 17, 1954, on flowers of *Bidens bipinnata* L., H. V. Weems, Jr.; Gainesville, Fla., October 1, 1956, working on rose stem, S. H. Kerr; Gainesville, Fla., Oct. 15, 1956, in rose stem, S. H. Kerr and R. A. Morse. Collection records from the United States National Museum are as follows: Grassy Key, Fla., Jan. 3, 1951, H. V. Weems, Jr.; Key Largo, Fla., March 26, 1954, K. V. Krombein; Ft. Pierce, Fla., April 2, 1954. Collection records by the describer (Pate, 1946) are as follows: Indian River (type, no date or collector given in Pate's description); Cocoa (allotype and nine paratypes), July, 1944, G. E. Bohart; and St. Augustine (no further information given).

It would thus appear that the wasp is active the year around in Florida and possibly has more than one generation per year although *Ectemnius* species which have been studied farther north have but one. In correspondence, Mr. K. V. Krombein of the United States National Museum stated that he felt the range of *E. texanus ais* did not extend north of Florida, while the typical species, *E. texanus texanus* (Cresson), was found as far south as Gainesville, Florida, and had been recorded from New York to Florida and west to Texas and Kansas.

The genus *Ectemnius* belongs to the family Sphecidae, subfamily Crabroninae, a group sometimes referred to as the wood wasps. Wasps in the genus *Ectemnius* are distinguished by their large cubical head. *E. texanus ais* is about one-half inch long and black with two transverse yellowish-red stripes on the thorax and three on the abdomen. According to Pate (1946), it is "distinguished from the nominate form of *texanus* by its deep fuliginous wings, reddish livery, and more strongly punctured and sculptured body."

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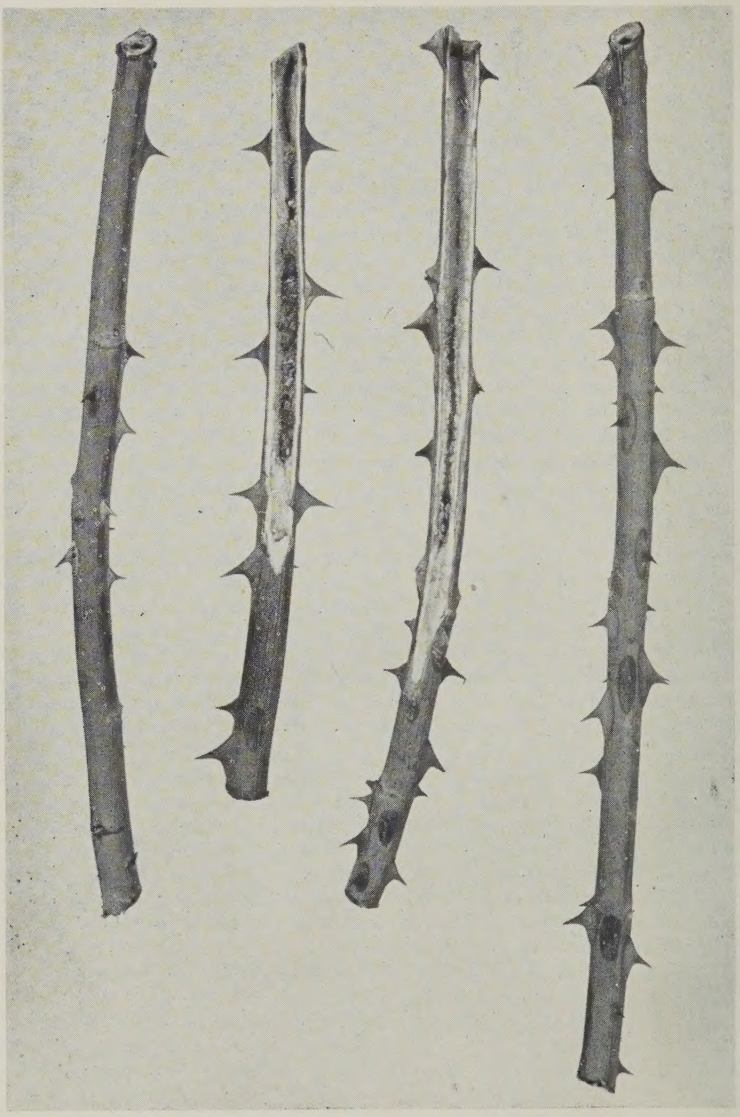

Fig. 1.—Four rose stems infested by *Ectemnius* (*Hypocrabro*) *texanus ais* Pate. The stems to the left and right show only the entrance hole made by the adult wasps. The stem which is the second from the left had an over-all length of 16.8 cm. The length of the bore is 9.3 cm. and this nest contains three cells. The stem second from the right has an over-all length of 20 cm., a bore length of 11.5 cm., and contained only one cell.

The accompanying photograph shows some rose stems collected in Gainesville. It will be noted that the individual cells are not well differentiated. The maximum number of three cells was found per stem in ten which were closely examined. The length of completed tunnels was 9-15 centimeters; bore diameter was 0.4-0.45 centimeters.

The female wasp provisions the cells with small flies. About 20-30 flies per cell appear to be the usual number. Dr. H. V. Weems, Jr., of the Florida State Plant Board, has identified the flies from four of cells of *E. texanus ais* and found the following:

Cell 1. All *Euxesta nitidinentris* Lw. (*Otididae*)

Cell 2. Almost all *Aciura insecta* Lw. (*Trypetidae*)
One or two *Paroxyna sorocula* (Wd.) (*Trypetidae*)
One or two Chloropidae sp.

Cell 3. Almost all *Paroxyna sorocula* (Wd.)
A few *Aciura insecta* Lw.
A few Chloropidae sp.

Cell 4. Half *Aciura insecta* Lw.
Half *Paroxyna sorocula* (Wd.)

Rau and Rau (1918) and Peckham and Peckham (1898) list about 15 other species which they found in cells of *E. stirpicola* Packard. It seems likely that *Ectemnius* species provision their nests with whatever small fly species are available.

Other hymenopterous insects which bore into the pith of roses in Florida include leaf-cutter bees of the family Megachilidae. A cephid wasp, *Hartigia trimaculata* (Say), is recorded as economically important on roses in Florida by Muesebeck et al. (1951), and it is presumed this insect burrows into the stems of roses after the fashion of *H. cressoni* (Kirby) in California (Butterfield, 1950). *H. trimaculata* has not been taken in collections made by Experiment Station or Florida State Plant Board personnel and it would appear to be relatively uncommon here. There are a number of other insects recorded as rose stem borers in other states.

Several other species and subspecies of *Ectemnius* have been collected in Gainesville by Mr. H. E. Bratley of the Agricultural Experiment Station. They are similar in appearance to *E. texanus ais*, but their habits are not known.

An account of the nest-building activities of *Ectemnius* (*Crabro*) *stirpicola* Packard by Peckham and Peckham (1898) stated that the adult female bites out pith pellets. The pellets are passed back between the legs and when a quantity has accumulated above the abdomen, the female walks backward up the burrow to push out the mass. After the cells are completed, *Ectemnius* females do not plug up the entrance to the burrow as is usual with some Hymenoptera of more or less similar habits.

A satisfactory method of control is to treat the cut end of pruned canes immediately with a tree wound paint. Homeowners who have only a few canes to treat may resort to the use of a thumbtack to cover the wound.

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Two Changes of Name in Hemiptera (Aneuridae and Miridae).—*Aneurus tenuicornis* Champion, 1898 (*Biol. C.-Amer., Hem.-Het.* 2: 116), is a junior primary homonym of *Aneurus tenuicornis* Signoret, 1860 (*Ann. Soc. Ent. France* (3) 8: 958), and I therefore propose Aneurus leptocerus, new name, to replace it.

In his *Heteroptera of Eastern North America,* published October 18, 1926, Blatchley described as new three species of the mirid genus *Phytocoris* which were credited to "Knight MS." Descriptions of these three species (*P. albitylus, P. angustifrons,* and *P. rubellus*) had already appeared, however, in a paper by Knight (1926, *Bull. Brooklyn Ent. Soc.* 21: 158-168) published about two weeks earlier than Blatchley's book (cf. Knight, 1927, *Bull. Brooklyn Ent. Soc.* 22: 101).

Blatchley's descriptions of *P. albitylus* and *P. rubellus* were correctly applied to the proper species. He misunderstood *P. angustifrons,* however, redescribing it (page 713) as *Phytocoris megalopsis,* n. sp., and using the name "*angustifrons* Knight M.S." (page 727) for a species which falls in a different species group within the genus. Knight (1927 loc. cit.) placed *megalopsis* Blatchley as a synonym of *angustifrons* Knight. Blatchley (1928, *Bull. Brooklyn Ent. Soc.* 23: 15) tacitly acknowledged this synonymy and admitted that he "had described what proved to be another species as *angustifrons.*" He failed, however, to identify this latter species by name, nor can I find that anyone else has done so, though it is a common *Phytocoris* in central and northern Florida. I therefore propose Phytocoris pseudonymus, new name, to replace *Phytocoris angustifrons* Blatchley, 1926, (*Het. E. N. Amer.* p. 727), nec *Phytocoris angustifrons* Knight, 1926, (*Bull. Brooklyn Ent. Soc.* 21: 164).—Roland F. Hussey, *Biology Department, University of Florida.*

THE GENUS *TENUIPALPUS* IN MEXICO (ACARINA: TENUIPALPIDAE)

Donald De Leon
Coral Gables, Florida

The plant feeding mites of the genus *Tenuipalpus* are widely distributed in Mexico and some species, such as *T. bakeri* McG. on coffee and *T. tabebuiae* n. sp. on roble blanco, cause severe injury.

At present eighteen species are known to occur in Mexico, thirteen of which are described here as new. Four others are new records for Mexico.

In the following descriptions all measurements are in microns and body lengths include the rostral shield.

Key to Species (Females)

1. Opisthosoma with five similar pairs of dorsolaterals ..... *meekeri*
   Opisthosoma with five pairs of dorsolaterals, the fourth long and whip-like 2

2 (1). Podosoma with one pair of anterior and one pair of posterior medioventrals 3
   Podosoma with either two pairs of anterior and one pair of posterior, or one pair of anterior and two pairs of posterior medioventrals 14

3 (2). Coxa III with a seta on anterior margin 4
   Coxa III without seta on anterior margin 13

4 (3). All dorsocentral hysterosomals greatly enlarged and about as long as or longer than transverse distance between bases 5
   At least one pair of dorsocentral hysterosomals small and much shorter than transverse distance between bases 6

5 (4). Patella III without seta; third dorsal propodosomal rather broad and reaching about half way to hysterosomal suture ..... *dasples*
   Patella III with enlarged seta; third dorsal propodosomal rather narrow and reaching nearly to hysterosomal suture ..... *coyacus*

6 (4). Palpus one-segmented ..... *unimerus*
   Palpus more than one-segmented 7

7 (6). Hysterosoma with large projection anterior to coxa III and humeral seta not arising from it ..... *lucumae*
   Hysterosoma without, or at least with only a small or moderate projection anterior to coxa III and humeral seta, if body projection present, arising from it 8

8 (7). Patellae I and II each with a seta on anterior margin only ..... *tabebuiae*
   Patellae I and II each with a seta on anterior and posterior margins 9

9 (8). Patella III with seta (on anterior margin) 10
   Patella III without seta 11

10 (9). Patella IV with seta on anterior margin; body more than twice as long as wide; nymph without distinctive dorsocentral hysterosomals ..... *tepicanus*
Patella IV without seta; body less than twice as long as wide; nymph with first pair of dorsocentrals nearly as long as width of body ..... *crescentiae*

11 (9). Third dorsal propodosomal enlarged; first three dorsolateral opisthosomals enlarged and longer than distances between bases ..... *kapoki*
Third dorsal propodosomal setiform or nearly so; first three dorsolateral opisthosomals setiform, short, shorter than or about as long as distances between bases 12

12 (11). Dorsum with prominent longitudinal ridges; nymph with coarse, spiculate dorsocentral hysterosomals ..... *sanblasensis*
Dorsum irregularly striate, not with pronounced ridges; nymph with minute dorsocentrals ..... *burserae*

13 (3). Tarsi I and II each with a seta overlying rod-like seta; nymph with coarse, spiculate dorsocentral hysterosomals ..... *cedrelae*
Tarsi I and II each without a seta overlying rod-like seta; nymph with minute dorsocentrals ..... *anoplus*

14 (2). Podosoma with two pairs of posterior and one pair of anterior medioventrals ..... *annonae*
Podosoma with one pair of posterior and two pairs of anterior medioventrals 15

15 (14). A seta on posterior margin only of patellae I and II; first dorsal propodosomal enlarged ..... *chiclorum*
A seta on anterior and posterior margins of patellae I and II; first dorsal propodosomal small 16

16 (15). Dorsocentral hysterosomals minute; third dorsal propodosomal reaching about one third the distance to hysterosomal suture ..... *coccolobicolus*
Dorsocentrals greatly enlarged; third dorsal propodosomal reaching about half way to hysterosomal suture 17

17 (16). Dorsum with strong striate pattern ..... *rhyssus*
Dorsum with a few transverse striae ..... *bakeri*

Tenuipalpus meekeri, n. sp.
(Figures 1a and 1b)

T. meekeri is readily distinguished from all other members of the genus by having the fourth dorsolateral opisthosomal seta similar to the other four which are broady expanded.

FEMALE: Red. Dorsum of propodosoma with a few faint striae extending posteromedially from third propodosomal. First and second dorsal propodosomals elliptic, about 8 long and 3 wide; third elliptic, 93 long, 30-36 wide and arising from near base of a large lateral lobe; humeral fan-shaped, 54 long, 47-55 wide; dorsolateral metapodosomal about 13

long, 4 wide; dorsocentral hysterosomals obovate, 60, 58, and 45 long respectively, all three about 27 wide, transverse distances between bases, 58, 34, and 21 respectively; dorsolateral opisthosomals elliptic, 58-90 long, 25-45 wide. One pair of anterior and one pair of posterior medioventrals. Palpus apparently four segmented, of shape shown in figure. Legs I-III with both setiform and enlarged setae; coxa III with a setae on anterior margin; patellae I and II each with two setae on anterior margin; the upper one narrowly obovate, the lower one setiform and each with one seta on posterior margin; patella III with a seta on anterior margin; patella IV bare; tarsi I and II each with a posterodistal curved, rod-like seta and an elliptic seta overlying it. Length 420, width 322.

MALE: Resembles female, but setae in general smaller and second and third dorsocentrals setiform. Length 324, width 257.

NYMPH: Resembles female, but dorsocentrals not enlarged.

Holotype: Female, San Blas, Nayarit, March 31, 1957, (D. De Leon) from fern in mangrove swamp. *Paratypes:* One male, four females, five nymphs, same data as for holotype. The mite is named for Mr. Granville Meeker of Tacoma, Washington, who was instrumental in the collecting of this and several other interesting mites.

Tenuipalpus coyacus, n. sp.
(Figure 2)

T. coyacus is closely related to *T. dasples* Baker and Pritchard (1953), but differs from it by having among other characters a much longer third dorsal propodosomal and a seta on patella III.

FEMALE: Red. Dorsum of body medially with numerous irregular, mostly transverse ridges; lateral of those on opisthosoma small rounded knobs. First dorsal propodosomal small, second 72 long, 17 wide; third narrowly lanceolate, 78 long. Humeral seta 34 long, 14 wide; dorsolateral metapodosomal elliptic, small. Dorsocentral hysterosomals broadly obovate, 45-55 long, about as long as transverse distances between respective bases. Fourth dorsolateral opisthosomal long and whip-like, the others elliptic, 22-27 long, about 12 wide and distinctly longer than distances between bases. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Legs with both enlarged and setiform types of setae; coxa III with a seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins; patella III with seta on anterior margin; patella IV bare; tarsi I and II each with a posterodistal rod-like seta and an overlying seta. Length 362, width 188.

MALE: Resembles female, but body setae proportionally smaller. Length 322, width 154.

NYMPH: Second dorsal propodosomal small, slightly longer than wide, third propodosomal shorter than in adult; dorsocentral hysterosomals short, elliptic.

Holotype: Female, San Blas, Nayarit, March 28, 1957, (D. De Leon) from coco de aceite. *Paratypes:* Three females, four males, two nymphs, Aticama, Nayarit, April 8, 1957, same host.

Tenuipalpus unimerus, n. sp.
(Figure 3)

T. unimerus is somewhat similar to *T. metopii* De L. (1956) differing from this species in having the propodosoma medially with a pronounced pattern of ridges, the dorsolateral hysterosomals elliptic, and the terminal seta of the palpus smooth.

FEMALE: Red. Dorsum of propodosoma with a ridge (sometimes broken) extending posterially from each of the first propodosomals, these ridges usually connected by two to four irregularly, somewhat transverse ridges, with other shorter, smaller ridges between them and lateral of them; dorsum of hysterosoma with irregular ridges mostly extending posteromedially. First and second dorsal propodosomals minute, elliptic; third setiform to very narrow elliptic, 36-45 long; humeral seta elliptic, spiculate, about 8 long; dorsolateral metapodosomal and dorsocentral hysterosomals minute; dorsolateral opisthosomals, except the fourth, elliptic, 10-14 long and about 4 wide. One pair of anterior and one pair of posterior medioventrals. Palpus one-segmented with a long smooth terminal seta. Legs I-III with setiform, very narrow elliptic and elliptic setae; coxa III with a coarse, setiform seta on anterior margin; patellae I and II each with a seta on anterior margin; patellae III and IV bare; tarsi I and II each with a posterodistal rod-like seta and an elliptic overlying seta. Length 286, width 190.

MALE: Not known.

NYMPH: Resembles adult in general chaetotaxy.

Holotype: Female, San Blas, Nayarit, March 31, 1957, (D. De Leon) from guamacate. *Paratypes:* Six females and two nymphs, same collection data as for holotype.

Tenuipalpus lucumae, n. sp.
(Figure 4)

T. lucumae has one pair of anterior and one pair of posterior medioventrals and the dorsocentrals minute. It appears to be most closely related to *T. hastaligni* De L. (1956), but differs from this species by the enlarged setae of the legs and body being proportionally much larger, the humeral seta arising from the body proper and not the body projection, and by other characters.

FEMALE: Greenish. Dorsum of propodosoma with a few faint ridges extending diagonally in from second propodosomal to about over the anterior medioventrals. First and second dorsal propodosomals narrow-elliptic, about 5 long; third propodosomal lanceolate, 70 long, 21 wide; humeral seta broadly lanceolate 45 long, 25 wide and arising just anterior of a large bluntly pointed body projection; dorsolateral metapodosomal about the size of dorsocentral hysterosomals; dorsocentrals setiform, 6-10 long; dorsolaterals, except the fourth, elliptic the first three about 56 long, 20 wide, the fifth about 32 long, 19 wide. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Legs I-III with both enlarged and setiform types of setae; coxa III with an elliptic seta on anterior margin; patellae I and II each with an elliptic seta on anterior and posterior margins and a setiform seta below the elliptic seta of the anterior

margin; patella III with an elliptic seta on anterior margin reaching to beyond base of tarsus; patella IV bare; tarsi I and II each with a posterodistal rod-like seta and a lanceolate overlying seta. Length 328, width 258.

MALE: Resembles female, but first dorsolateral opisthosomal somewhat smaller than second and third; body projection anterior to coxa III narrower and more finger-like. Length 257, width 177.

DEUTONYMPH: Propodosoma with pronounced anterolateral lobe as in female.

Holotype: Female, Tuxtla Gutierrez, Chiapas, January 18, 1957, (D. DeLeon) from *Lucuma salicifolia*. *Paratypes:* Eight females, two males, three nymphs; same data as for holotype.

Tenuipalpus tabebuiae, n. sp.

(Figure 6)

T. tabebuiae has one pair of anterior and one pair of posterior medioventrals and the dorsocentral hysterosomals minute. It appears to be most closely related to *bucidae* DeL. (1956), but differs from that species by having a three-segmented palpus and shorter dorsolateral opisthosomals.

FEMALE: Ranging in color from greenish to reddish. Dorsum of body with faint more or less longitudinal striae in mid-lateral area; a small rounded body projection just anterior of coxa III. First dorsal propodosomal setiform, second very narrow elliptic, both about 7 long; third coarsely setiform to very narrow elliptic, 30-37 long; humeral narrow-elliptic 16 long; dorsolateral metapodosomal and dorsocentral hysterosomals setiform, about 7 long; dorsolateral opisthosomals, except the fourth, narrow-elliptic, first three about 18 long and distinctly longer than distance between bases, fifth about 12 long. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Legs with setiform and very narrow elliptic, spiculate setae; coxa III with a seta on anterior margin; patellae I and II each with a seta on anterior margin, patellae III and IV bare; tarsi I and II each with a posterodistal rod-like seta and an overlying setiform seta. Length 266, width 160.

MALE: Not known.

NYMPH: Resembles female.

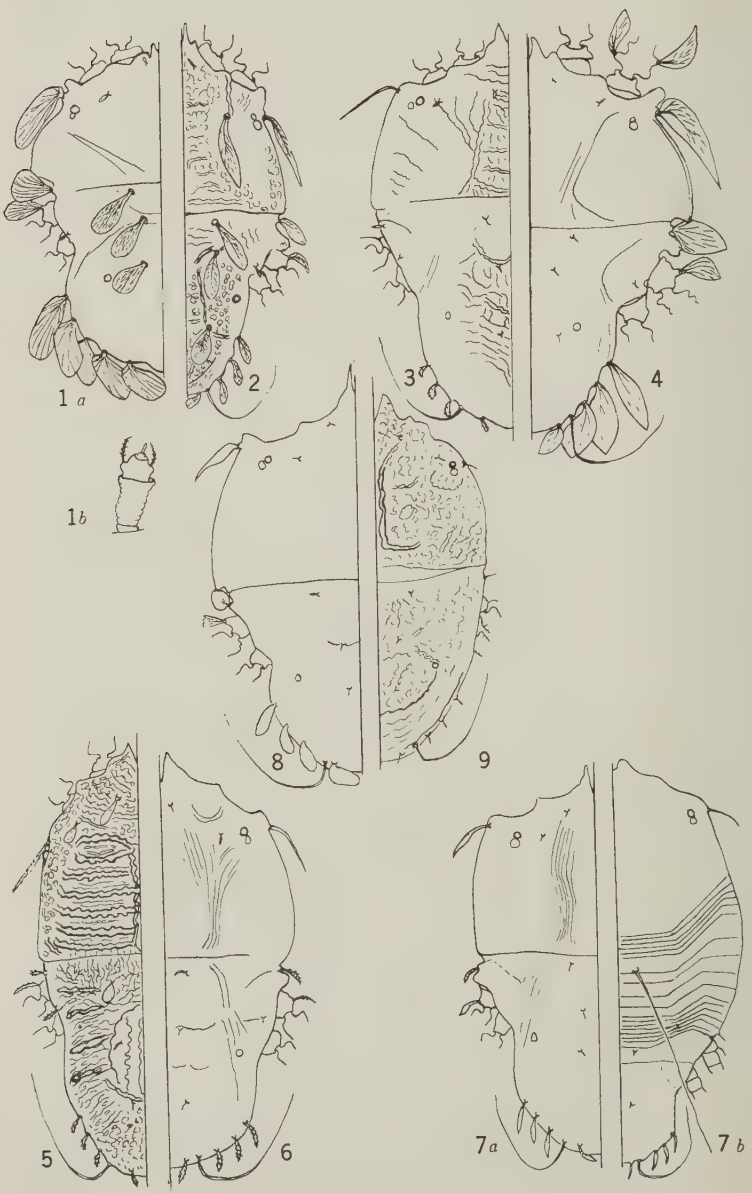
Holotype: Female, San Blas, Nayarit, March 28, 1957, (D. De Leon) from *Tabebuia pentaphylla*. *Paratypes:* Two females, three nymphs, Tamazunchale, San Luis Potosi, December 21, 1956; two females, one nymph, Tuxtla Gutierrez, Chiapas, January 11, 1957; six females, one nymph, San Blas, Nay., March 28, 1957, all from *Tabebuia*.

Tenuipalpus tepicanus, n. sp.

(Figure 5)

T. tepicanus has one pair of anterior and one pair of posterior medioventrals. It differs from all others having this character in that the anterior pair is barbulate; the transversely striate pattern of the propodosoma is also distinctive.

FEMALE: Most of body chocolate coloured with margins of hysterosoma dirty white. Propodosoma with a pair of median longitudinal ridges and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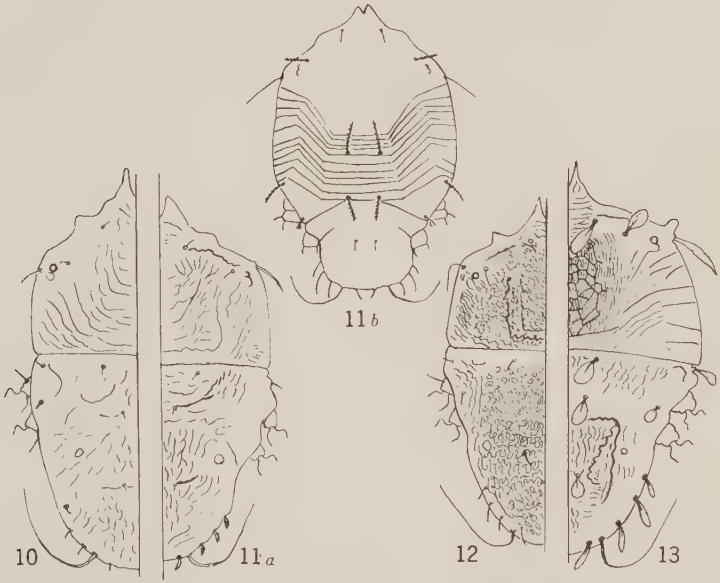

THE GENUS TENUIPALPUS IN MEXICO

Females and nymphs of new species of *Tenuipalpus*.

Plate 1

Fig. 1a. *meekeri*
Fig. 1b. *meekeri* (palpus)
Fig. 2. *coyacus*
Fig. 3. *unimerus*
Fig. 4. *lucumae*
Fig. 5. *tepicanus*
Fig. 6. *tabebuiae*
Fig. 7a. *crescentiae*
Fig. 7b. *crescentiae* (nymph)
Fig. 8. *kapoki*
Fig. 9. *sanblasensis*

Plate 2

Fig. 10. *burserae*
Fig. 11a. *cedrelae*
Fig. 11b. *cedrelae* (nymph)
Fig. 12. *annonae*
Fig. 13. *chiclorum*

with five to seven transverse ridges with smaller irregularly transverse ridges between them; area of hysterosomal suture longitudinally striate; hysterosoma with mostly transverse ridges. First and second propodosomals elliptic, about 23 and 10 long respectively; third coarsely setiform and spiculate, 28 to 38 long; humeral about 10 long, spiculate; dorsolateral metapodosomal elliptic, spiculate, about 13 long; first dorsocentral hysterosomal elliptic, about 15 long, distance to opposite member 38; second and third minute. Dorsolaterals, except fourth, elliptic, spiculate, about 10 long. One pair of anterior medioventrals (barbulate) and one pair of posterior medioventrals (bare); the anterior ventrolateral, the two ventrolateral metapodosomals, and the anal setae barbulate. Palpus three-segmented. Legs with setiform and very coarsely setiform, spiculate setae; coxa III with a coarse seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins, patellae III and IV each with a seta on anterior margin; tarsi I and II each with a posterodistal rod-like seta and a setiform overlying seta. Length 317, width 147.

Male: Resembles female; length 265, width 117.

Deutonymph: Similar to female.

Holotype: Female, San Blas, Nayarit, March 28, 1957, (D. De Leon) from capulincillo. *Paratypes:* Two males, four females, two nymphs; same data as for holotype; two females, Aticama, Nay., April 13, 1957, same host.

Tenuipalpus crescentiae, n. sp.
(Figures 7a and 7b)

T. crescentiae has one pair of anterior and one pair of posterior medioventrals, minute dorsocentrals and enlarged dorsolaterals. It appears to be most closely related to *T. podocarpi* Lawrence, but differs from the description and drawing (after Lawrence) given for that species by Baker and Pritchard in the general shape of the body, the broader body projection, the smaller leg and body setae and the presence of only two setae on patella I.

Female: Reddish to greenish yellow in colour. Propodosoma faintly, longitudinally striate in middle third; hysterosoma without distinctive markings. First and second dorsal propodosomals minute, third very narrow elliptic, 40 long; humeral elliptic, 12-18 long; dorsolateral metapodosomal and dorsocentral hysterosomals minute; dorsolateral opisthosomals, except the fourth, narrow-elliptic, about 22 long and appreciably longer than distances between bases. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented, second segment long and narrow with sides nearly parallel. Coxa III with a narrow-elliptic seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins; patella III with seta on anterior margin; patella IV bare; tarsi I and II each with a posterodistal rod-like seta about 12 long, and an overlying setiform seta. Length 275, width 161.

Male: Not known.

Deutonymph: First pair of dorsocentral hysterosomals about as long as width of body, in other characters resembles female; protonymph without long first pair of dorsocentrals.

Holotype: Female, San Blas, Nayarit, April 8, 1957, (D. De Leon) from cuasticomate. *Paratypes*: Five females, eight nymphs; same data as for holotype.

Tenuipalpus kapoki, n. sp.

(Figure 8)

T. kapoki has one pair of anterior and one pair of posterior medioventrals, and minute dorsocentrals. It appears to be most closely related to *crescentiae* DeL., but it differs among other characters from this species in that the setae are more enlarged, patella III is bare, and the body without a projection anterior to coxa III.

Female: Pale yellowish green. Dorsum without distinctive markings. First and second dorsal propodosomals minute, third lanceolate, 34-43 long, about 8 wide; humeral broadly elliptic, about 18 long, 14 wide; dorsolateral metapodosomal and dorsocentral hysterosomals minute; dorsolateral opisthosomals, except the fourth, elliptic, about 27 long. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Legs I-III with setiform and enlarged setae; coxa III with a seta on anterior margin; femora I and II each with only three setae; patella I and II each with a seta on anterior and posterior margins, patellae III and IV bare; tibia IV without a seta on anterior margin; tarsi I and II each with a minute (3 microns), club-shaped posterodistal seta (in place of the usual rod-like seta) and an overlying setiform seta. Length 285, width 195.

Male: Not known.

Nymph: Resembles female.

Holotype: Female, Tuxtla Gutierrez, Chiapas, January 18, 1957 (D. DeLeon), from *Ceiba pentandra. Paratypes:* One female, two nymphs; same data as for holotype.

Tenuipalpus sanblasensis, n. sp.

(Figure 9)

T. sanblasensis has one pair of anterior and one pair of posterior medioventrals, the dorsocentrals minute, and the dorsolaterals short and setiform. It appears to be most closely related to *T. anoplus* Baker and Pritchard (1953), but the dorsal ridges of the adult and the large dorsocentrals of the nymph are distinctive.

Female: Red. Propodosoma with pair of L-shaped ridges back to back along midline, both Ls sometimes broken at foot, the rest of the dorsum broken up by innumerable small ridges; hysterosoma with an oval area of small, more or less longitudinal ridges bounded anteriorly and posteriorly by stronger ridges and laterally by the pores, the rest of the dorsum broken up by small ridges. Dorsal propodosomals, humeral, dorsocentrals, and dorsolaterals, setiform, about 10 or less long, except the fourth. One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Leg setae setiform and small; coxa III with a seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins; patellae III and IV bare; tarsi I and II each with a posterodistal club-shaped seta and an overlying seta.

Male: Not known.

NYMPH: Both nymphal stages with rather coarse, spiculate second propodosomal, humeral and dorsocentrals; in the deutonymph these about 17, 15, 15, 16 and 7 long respectively.

Holotype: Female. San Blas, Nayarit, April 6, 1957, (D. De Leon) from naranjilla. *Paratypes*: 20 females, 11 nymphs; same data as for holotype.

Tenuipalpus burserae, n. sp.
(Figure 10)

T. burserae has one pair of anterior and one pair of posterior medioventrals, the dorsal body setae short and setiform, and all leg setae setiform. The species appears to be most closely related to *anoplus* Baker and Pritchard (1953), but differs from that species by its setiform setae, by coxa III with a seta on the anterior margin and by other characters.

FEMALE: Yellowish, a few with an orange tinge. Propodosoma with weak, irregular striae extending posteromedially, toward middle third becoming nearly transverse; hysterosoma with weak, irregular striae extending mostly posterolaterally, in some specimens three or four larger, more or less transverse striae cut across the smaller ones. All dorsal body setae setiform, short (less than 20 long except fourth dorsolateral opisthosomal). One pair of anterior and one pair of posterior medioventrals. Palpus three-segmented. Leg setae setiform, the ventral setae of coxae and femora apparently smooth; coxa III with a seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins; patellae III and IV bare; tarsi I and II each with a posterodistal rod-like seta and a slender overlying seta. Length 276, width 143.

MALE: Not known.

NYMPH: Resembles female.

Holotype: Female. Ocozocoatla, Chiapas, January 28, 1957; (D. De Leon) from *Bursera* sp. *Paratypes*: Five females, four nymphs; same data as for holotype.

Tenuipalpus cedrelae, n. sp.
(Figures 11a and 11b)

T. cedrelae has one pair of anterior and one pair of posterior medioventrals and all dorsal setae, except the fourth dorsolateral opisthosomal, short. It appears to be most closely related to *T. anoplus* Baker and Pritchard, but is readily distinguished from that species by having a seta overlying the rod-like seta of tarsi I and II; the larva and nymphs are also distinctive in having coarse, spiculate dorsocentrals.

FEMALE: Reddish. Propodosoma with many weak striae mostly directed irregularly posteromedially; opisthosoma mostly with irregular longitudinal striae. Third propodosomal spiculate, about 20 long, fourth opisthosomal long and whip-like, all other dorsal body setae less than 10 long, and spiculate. One pair of anterior and one pair of posterior medioventrals. Legs with only setiform setae; coxa III without a seta on anterior margin; patellae I and II each with a seta on anterior margin; patellae III and IV bare; tarsi I and II each with a posterodistal rod-like seta and a setiform overlying seta. Length 272, width 155.

MALE: Resembles female, but second dorsal propodosomal and dorsocentrals somewhat longer and coarser. Length 217, width 128.

NYMPH AND LARVA: Resemble female, but second dorsal propodosomal, humeral, and first and second dorsocentrals coarse and spiculate; for the deutonymph they are about 20, 18, 20-28, and 20 long respectively.

Holotype: Female, San Blas, Nayarit, April 19, 1957, (D. De Leon) from *Cedrela* sp. *Paratypes*: One male, 16 females, 17 nymphs, San Blas, March 28 and April 19, 1957.

Tenuipalpus annonae, n. sp.
(Figure 12)

T. annonae has one pair of anterior and two pairs of posterior medioventrals and two pairs of dorsocentrals. No other species possesses this combination of characters.

FEMALE: Pale apricot to pale salmon in color. Propodosoma with middle three-fourths covered by narrow, closely convoluted areolae and with a U-shaped depression; laterad areolae usually more or less straight and directed posteromedially; hysterosoma covered with narrow closely convoluted areolae. First and second propodosomals setiform, 10-15 long, third 23-30 long, setiform; humeral and lateral metapodosomal both about 12 long, setiform; dorsocentral hysterosomals both about 11 long, the second pair missing; dorsolateral opisthosomals, except the fourth, 9-15 long, setiform. One pair of anterior and two pairs of posterior medioventrals. Palpus three-segmented. Legs with setiform setae only; coxa III with a coarse seta on anterior margin; patellae I and II each with a seta on anterior and posterior margins; patellae III and IV bare; tarsi I and II each with a posterodistal rod-like seta and a slender overlying seta. Length 238 to 289, width 153.

MALE: Resembles female; length 241, width 138.

NYMPH: Similar to female.

Holotype: Female, Matias Romero, Oaxaca, January 30, 1957, (D. De Leon) from *Annona* sp. *Paratypes*: Three females, two nymphs; same data as for holotype; one male, two females, two nymphs, Tuxtla Gutierrez, Chiapas, January 28, 1957; five females, three nymphs, San Blas, Nayarit, March 28, 1957, all from *Annona* spp.

Tenuipalpus chiclorum, n. sp.
(Figure 13)

T. chiclorum has two pairs of anterior and one pair of posterior medioventrals and the dorsal propodosomals and hysterosomals are all enlarged. It appears to be most closely related to *T. argus* Baker and Pritchard (1953), but differs from that species in having the first propodosomal enlarged, a one-segmented palpus, and in other characters.

FEMALE: Pale brownish red. Center of propodosoma with net-like pattern of large ridges superimposed on small longitudinal ridges; hysterosoma with many small ridges more or less converging towards third pair of dorsocentrals. First propodosomal 28 long, 15 wide; second 23 long, 11 wide; third 33 long. Humeral 18 long; dorsolateral metapodosomal 14 long, 9 wide. Dorsocentrals 26, 21, and 21 long respectively, dorsolateral opisthosomals, except the fourth, 16, 23, 21 and 18 long respectively. Two pairs of anterior and one pair of posterior medioventrals. Palpus one-segmented,

with a long, apparently smooth, seta at end. Legs I-III with setiform and very narrow elliptic, spiculate setae; coxa III without a seta on anterior margin; patellae I and II each with a seta on posterior margin only, patellae III and IV bare; tarsi I and II each with a curved posterodistal rod-like seta and an elliptic overlying seta. Length 284, width 178.

MALE: Resembles female, but setae proportionally smaller. Length 230, width 130.

NYMPH: Essentially similar to female.

Holotype: Female, Tuxtla Gutierrez, Chiapas, January 21, 1957, (D. De Leon) from *Achras zapota*. *Paratypes*: One male, two females, two nymphs; same data as for holotype.

Paratypes of the above species will be deposited in the University of Florida Collections, Gniaesville.

The following species with the exception of *Tenuipalpus rhyssus* Baker and Pritchard (1953) have not previously been recorded from Mexico:

Tenuipalpus dasples Baker and Pritchard (1953)

T. dasples was collected from *Sabal* sp. near Veracruz, Ver., December 29, 1956.

Tenuipalpus anoplus Baker and Pritchard (1953)

Specimens having for the most part shorter and more slender dorsal body setae than *T. anoplus* from Florida were collected January, 1957, from *Swietenia macrophylla* and *S. humilis*, Tuxtla Gutierrez, Chiapas, and from *S. macrophylla*, Tehuantepec, Oaxaca. These specimens also differed in dorsal markings from the Florida specimens, but these and other small differences do not seem sufficient at this time to regard the Mexican specimens as other than variants of *anoplus*.

Tenuipalpus coccolobicolus De L. (1956)

T. coccolobicolus was collected from *Coccolobis* sp., Alvarado, Ver., January 7, 1957.

Tenuipalpus rhyssus Baker and Pritchard (1953)

I have not seen *T. rhyssus*, specimens of which were taken in 1950 at a U. S. A. port from camellia sent from Veracruz; however, specimens I collected at Cordoba, Veracruz, and other places and list below under *T. bakeri* McG. have both *rhyssus* and *bakeri* characters in varying degrees. In addition, mites taken from *Yucca* sp. at the edge of a coffee plantation infested with *bakeri* have *argus* Baker and Pritchard (1953) characters as well as *rhyssus* and *bakeri* characters. *T. rhyssus* and *T. argus* are species based in part by Baker and Pritchard on specimens identified by McGregor as *T. bakeri*. I am inclined to believe that the first two names have been applied to variants of *bakeri*.

Tenuipalpus bakeri McGregor (1949)

Collections of specimens which vary considerably, but all of which I have identified tentatively as *T. bakeri* are listed below:

Tamazunchale, S.L.P., December 21, 1956, two unknown hosts.

San Cristobal, Chiapas, January 22, 1957, *Arbutus glandulosa.*

Cordoba, Ver., February 3 and 4, 1957, Coffee, Yucca, unknown host, Tillandsia.

San Blas, Nay., March 29, 1957, unknown host.

Acknowledgment

I wish to thank Mr. Miguel Angel Palacios Rincón, of the Instituto de Historia Natural de Chiapas, Tuxtla Gutierrez, who most graciously identified the host plants I collected while in Chiapas.

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ABUNDANCE OF APHIDS AND CATERPILLARS IN COMMERCIAL CABBAGE FIELDS IN THE VICINITY OF SANFORD, FLORIDA [1]

JOHN W. WILSON
Central Florida Experiment Station, Sanford

During a study of host preference of insects that attack cole crops, Harrison and Brubaker (1943) found that in the vicinity of Baton Rouge, Louisiana, the imported cabbage worm, *Pieris rapae* (L.), the cabbage looper, *Trichopulsia ni* (Hbn.), and the larvae of the diamondback moth, *Plutella maculipennis* (Curt.), in the order named, were the more important caterpillars on cole crops. From the Charleston, South Carolina area, Reid and Bare (1952) reported that on the fall crop the cabbage looper, several species of agrotinae, and the cabbage webworm, *Hellula rogatalis* (Hulst) were the most abundant. On the spring crop the diamondback moth, the cabbage looper, and the imported cabbage worm were the most numerous. In eastern Ontario, Harcourt et. al. (1955) found that the imported cabbage worm, the diamondback moth, and the cabbage looper were the most abundant on the early crop, while the diamondback moth, the imported cabbage worm, and the cabbage looper were the most abundant on the late crop. The cabbage looper at no time formed a significant portion of the species complex in eastern Ontario, although this species had been generally believed to be the most abundant of the three.

Since the use of the hydrocarbon and phosphatic insecticides has become widespread, cabbage growers in the vicinity of Sanford, Florida, have practiced what they call "preventive insect control." In many cases this means that an application of toxaphene or toxaphene combined with parathion is applied once or twice a week regardless of the presence of insect pests. In some instances the toxaphene is applied alone during the early part of the week, to be followed by an application of TEPP dust later in the same week. During the past two years many growers in this area have complained that toxaphene is no longer as effective as when it was first used. Observations in the untreated plots in experimental plantings at the Experiment Station and in commercial fields gave the author the impression that growers in the Sanford area were wasting tremendous amounts of insecticides and encouraging the development of insecticide-resistant crop pests. The need to confirm these observations led to a survey of insects attacking commercial cabbage fields. This survey has been conducted during the past four growing seasons in the vicinity of Sanford, Florida.

The acreage planted to cabbage in the Sanford area varied from 1,850 during the 1954-55 season to 2,750 in the 1952-53 season (Scarborough, 1955). Plants for the early fall crop are transplanted to the field during the latter part of September. Successive plantings are made through October, November, December, and January. The harvesting of cabbage usually begins during the latter part of November and is completed during the latter part of March, but the season extended into the second week of May at the end of the 1955-56 season.

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[1] Florida Agricultural Experiment Stations Journal Series, No. 591.

Methods

At the beginning of each growing season, five to ten commercial fields were selected at widely scattered locations in the vicinity of Sanford. Each of these fields was visited almost every week beginning two to three weeks after the plants were set and continuing to the time of the first harvest. At two locations in each field, 25 successive plants in each of four adjoining rows were examined. The two locations were on a diagonal across the fields. No effort was made to return to exactly the same location every week, but the counts were made in the same general area each week. During the first two seasons the numbers of cabbage loopers, imported cabbage worms, diamondback moth larvae, and cabbage webworm larvae were recorded. During the last two seasons the numbers of plants infested by the green peach aphid, *Myzus persicae* (Sulz.), and the cabbage aphid, *Brevicoryne brassicae* (L.), were recorded in addition to the numbers of the four worm species. When the plants in a field had reached maturity, and at the last visit to the field, the number of plants sufficiently injured by worms and aphids to cause them to be placed in a grade lower than U. S. 1 Green was recorded during the 1955-56 season. When fields were dropped because they had reached maturity, new fields were added to keep the number of fields surveyed at or near ten.

Results and Discussion

During each of the four growing seasons, 1952-53 through 1955-56, the diamondback moth, the imported cabbage worm, and the cabbage webworm were found only during the early fall months in very small numbers, therefore, the data for these insects are not presented. Figures 1 and 2 show the weekly populations for the cabbage looper, and weekly average temperatures for the 1952-53 and 1953-54 growing seasons. Figures 3 and 4 represent populations for both the cabbage looper and the cabbage aphid with weekly average temperatures for the 1954-55 and 1955-56 growing seasons. Data for the cabbage aphid are available for these latter two growing seasons only.

TABLE 1.—Correlation of Cabbage Looper Populations with Temperatures.

Growing Season	Correlation Coefficient
1952-53	+0.45
1953-54	+0.55
1954-55	+0.54
1955-56	+0.53

It is evident from the data presented that there were two peaks of cabbage looper populations, one occurring during the early fall and the other during the late spring. From the latter part of November to early March, the populations of cabbage loopers were insignificant. It is also evident that

fluctuations in looper populations are correlated with the seasonal temperatures. Although the correlation coefficient values given in Table 1 are low, each of these values is significant at the five per cent level. The application of control chemicals in the survey fields was probably the principal factor causing the correlation coefficient values to be low.

For the two seasons that data are available, cabbage aphid populations were low during the early fall and gradually increased, as the growing season advanced, to a high peak near the end of the growing season. This increase in cabbage aphid populations started during late November and early December when the temperatures were lowest; thus there was no correlation between the abundance of cabbage aphids and temperature. The

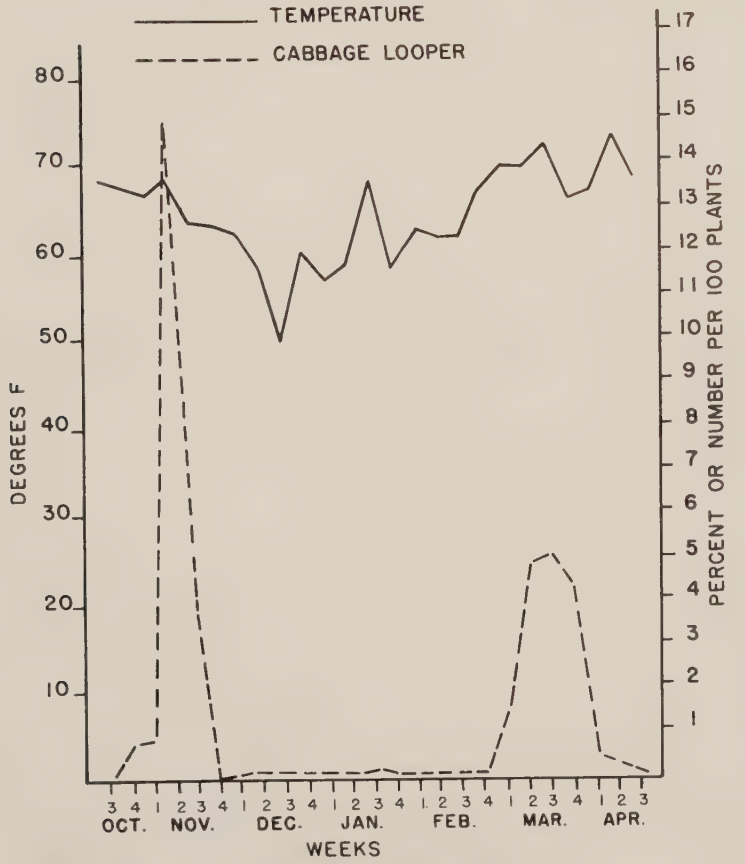

Fig. 1.—Mean temperatures and cabbage looper populations for the 1952-53 growing season.

fluctuations in cabbage aphid populations were probably due, in large part, to the application of aphicides. The green peach aphid was observed on young cabbage plants throughout both growing seasons in such small numbers that the records for this insect are not presented.

During the four-year period that this survey was conducted, cabbage insect populations in untreated plots at the Experiment Station Farm were so low that the effectiveness of experimental insecticides and experiments to determine the number of applications required could not be evaluated.

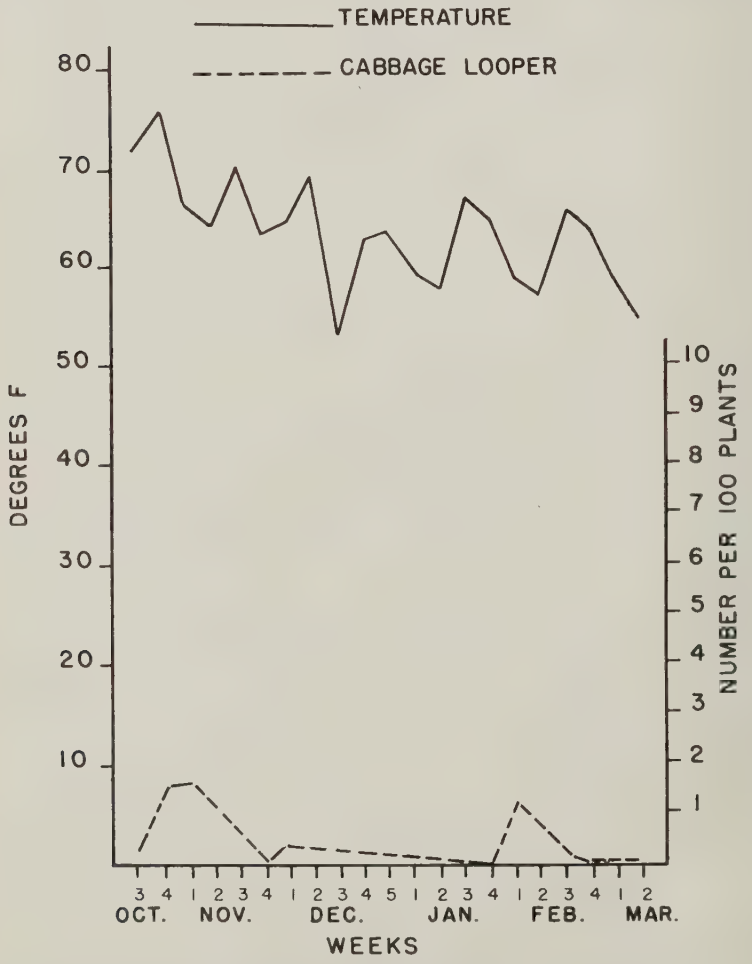

Fig. 2.—Mean temperatures and cabbage looper populations for the 1953-54 growing season.

TABLE 2.—Summary of the Data on Injury Caused by Cabbage Loopers and Cabbage Aphids During the 1955-56 Growing Season.

Initiation date of survey	Number of fields	Total number plants examined	Number of plants injured by Cabbage looper	Number of plants injured by Cabbage aphid
October	6	1200	39	0
November	5	1000	1	15
December	5	1000	11	20
January	7	1400	185	21

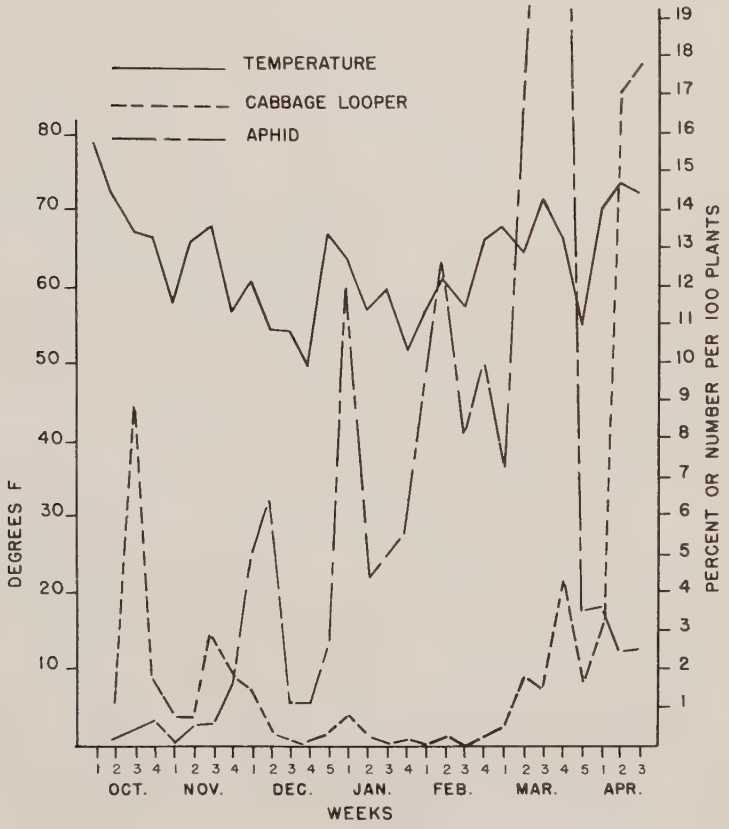

Fig. 3.—Mean temperature, cabbage looper and cabbage aphid populations for the 1954-55 growing season.

The imported cabbage worm, the diamondback moth, and the cabbage webworm were not found from the first week in December to the second week in April in the commercial fields surveyed. As has been pointed out, populations of the cabbage looper were very low during this period. These observations and the data presented indicate that the number of applications of insecticides for caterpillar control could be reduced provided careful inspections are made to determine the proper timing of the applications.

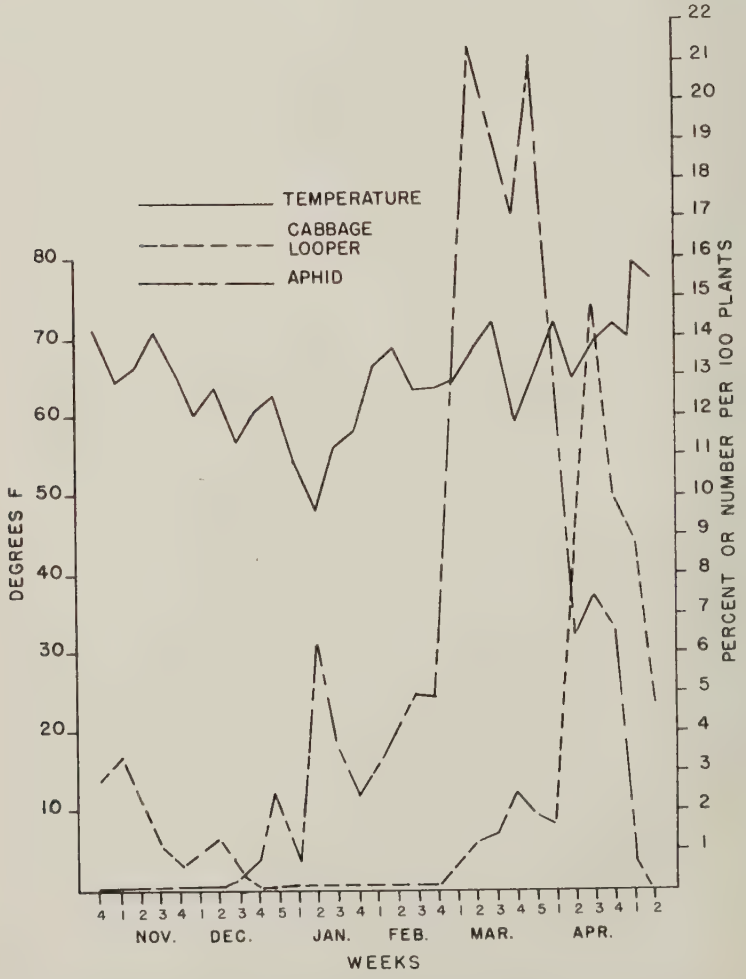

Fig. 4.—Mean temperatures, cabbage looper and cabbage aphid populations for the 1955-56 growing season.

Because of the low populations of both cabbage loopers and cabbage aphids during all four seasons, it was considered desirable to gather data on the actual damage caused by these two insects. The figures given in Table 2 represent the numbers of looper or aphid injured plants in 200 plants examined in each field at the time the first heads were harvested. These figures confirm the conclusion that the populations were very low and indicate that the economic losses suffered by the growers due to the activities of these two insects were not great.

Summary

During the four growing seasons, 1952-53 through 1955-56, populations of the imported cabbage worm, diamondback moth, cabbage webworm, and green peach aphid were very low in commercial fields in the vicinity of Sanford, Florida. Graphs are presented showing the average temperatures and populations at weekly intervals of the cabbage looper for the four growing seasons and the cabbage aphid for the last two growing seasons.

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TWO NEW SPECIES OF *CULICOIDES* FROM FLORIDA (DIPTERA: HELEIDAE)

ELISABETH C. BECK
Florida State Board of Health, Bureau of Entomology

Two undescribed species of *Culicoides* were collected from the area around Marianna, Florida, during the course of a mosquito-trapping experiment conducted during May and June, 1955, by the Bureau of Entomology, Florida State Board of Health. These two new species are described below. Holotypes and allotypes have been deposited in the United States National Museum and paratypes have been placed in the collections of the University of Florida collections, Gainesville, and the Entomological Research Center of the Florida State Board of Health at Vero Beach.

Culicoides mulrennani n. sp.

FEMALE: Length about 1.1 mm., wing .77 x .375 mm.

Head dark brown; eyes very narrowly separated, bare. Antennae with flagellar segments in proportion of 21:18:18:18:18:18:18:18:27:27:27:30:45, antennal ratio thus 0.94; distal sensory tufts on segments III, XI-XV. Palpal segments in proportion of 8:18:18:9:8, third segment moderately swollen with a broad shallow subapical sensory pit with spoon-shaped sensillae. Mandibles with 12-13 teeth.

Mesonotum yellowish brown with faint suggestion of three darker longitudinal stripes. Scutellum lighter, the postscutellum dark. Legs pale brown, the fore and medium knees dark brown with narrow white bands above and below; hind femur dark at apex, hind tibia with narrow light basal band, and broadly lighter at apex. Tibial comb with four long yellowish setae, the second longest.

Wing light gray, darker over radial cells; costa to 0.6 wing length; radial cells short with adjacent radial veins thickened, 2nd radial cell almost obliterated. Macrotrichia sparse, confined chiefly to tip and posterior margin of wing, with a few in middle of cells M_1 and M_2. Light spots lie over the r-m crossvein, at the end of the costa, and indistinct light spots at base of cell M_1, in Cu_1 and base and tip of anal cell.

Abdomen very light brown, spermatheca two, equal, spherical, the duct chitinized for a short distance. Rudimentary spermatheca present, but no apparent ring.

MALE GENITALIA (Fig. 1): Ninth sternum with broad, deep notch, the membrane not spiculate; the ninth tergum broad, without cleft at apex, the apicolateral processes long, slender, finger-like, and widely divergent. Basistyles stout, ventral root rather short and triangular, the dorsal root longer and slenderer; dististyles slender and slightly curved, tapering to bluntly rounded apices. Aedeagus with basal arch rounded, extending to two-thirds the total length, a schlerotized membrane joining the sides of the distal part of the arch, the footed base recurved, the short distal portion fairly broad, narrowing toward the tip. Parameres with heavy triangular footed bases, the stem slightly sinuous, tapering to very fine tips.

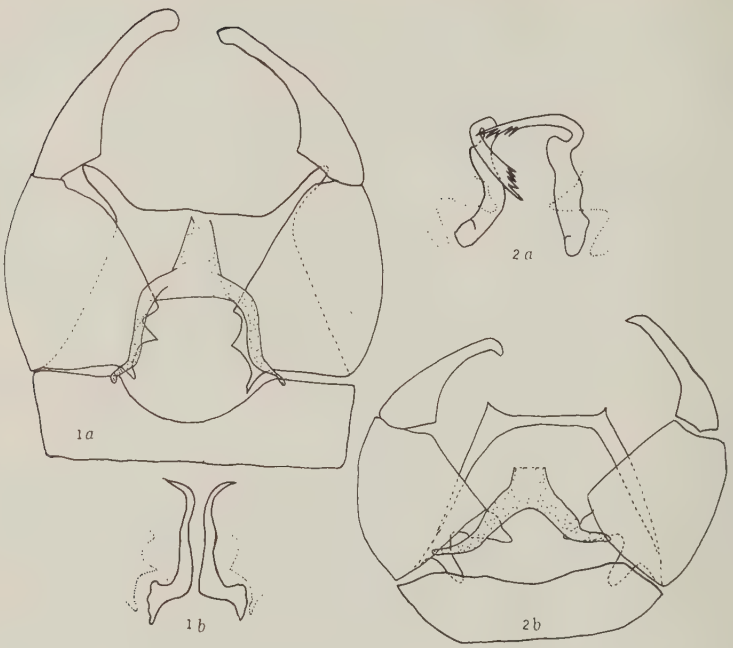

Fig. 1.—*Culicoides mulrennani* n. sp.
a. Male genitalia, parameres omitted.
b. Parameres.

Fig. 2.—*Culicoides khalafi* n. sp.
a. Male genitalia, parameres omitted.
b. Parameres.

Holotype female, allotype male: Marianna, Florida, 15 June, 1955, light trap. Paratype: 1 male, 14 females, same data.

This species occurred more frequently in light traps run early in the morning than in traps operated during the night. *C. mulrennani* appears to be closely related to *C. spinosus* Root and Hoffman, with male genitalia and female spermathecal systems similar in the two species.

I am indebted to Dr. W. W. Wirth, USNM, and Dr. R. H. Jones, USDA, Kerrville, Texas, for aid in determining the taxonomic status of this species.

I take pleasure in naming this species in honor of John A. Mulrennan, Director of the Bureau of Entomology, Florida State Board of Health, who has kindly encouraged my study of this genus.

Culicoides khalafi n. sp.

FEMALE: Length about 1.1 mm., wing .77 x .43 mm.

Head brown; eyes separated with hair socket between, bare. Antennae with flagellar segments in proportion of 18:18:21:24:24:24:24:24:24:27:

27:45, antennal ratio thus 0.83; distal sensory tufts on segments III, VII-X. Palpal segments in proportion of 6:20:20:8:10, third segment moderately swollen with a large deep cylindrical pit, the pit opening large. Mandibles with 14 teeth.

Mesonotum dark with rather indistinct pattern of grayish markings consisting of two submedian lateral stripes widening posteriorly to enclose the prescutellar depressions, and two more or less confluent spots on each side. Scutellum and postscutellum dark. Legs dark, knees blacker with light bands above and below, except hind femur is dark at apex; hind tibia with light apical band; tarsi lighter. Tibial comb with 4 spines.

Wing background gray with dark spot over 2nd radial cell and apical half of 1st radial cell; costa to 0.57 wing length; 2nd radial cell wider than 1st, adjacent veins swollen but both radial cells open. Distinct white spots over r-m crossvein from costa to vein M, at apex of 2nd radial cell under it, a squarish spot in the middle of cell R^5, not touching wing margins, near tip of M^1, M^2, and Cu^1, in anal cell below fork of Cu; the spots in M^2 and Cu^1 are sometimes open to wing margins. A less definite light spot lies at the base of cell M^1, in M^2 over fork of Cu, and a lighter confluent area over the base of wing, and anal cell. Macrotrichia are confined mainly to cell R^5 and apex of wing. Halteres dark.

Abdomen dark brown; spermatheca two, small, spherical, well-chitinized; duct chitinized for a short distance; rudimentary spermatheca and ring present.

Male Hypopygium: (Fig. 2): Ninth sternum with a broad shallow notch; the ninth tergum broad, without cleft at apex, the apicolateral processes very small and widely separated. Basistyles broad, ventral root roughly boat-hook shaped, dorsal roots broad and almost as long as ventral roots; Aedeagus short and broadly arched with serrated broadly truncate tip; Parameres with bases knobbed, stems slender and curved, with a ventral pouch, tips broader, with a fringe of 4 narrow subapical spines and a slightly wider distal spine.

Holotype female, Marianna, Florida, 28 April, 1956; Allotype males, Marianna, Florida, May, 1955. Paratypes: 1 male, Jacksonville, Florida, June, 1955; 4 males, 2 females, Marianna, Florida, May and June, 1955; 9 females, Marianna, Florida, 15 July, 1956. All specimens were taken in light traps.

This species has been taken in light traps at Marianna, Florida, and Jacksonville, Florida. It is apparently of the *debilipalpis* group; the wing pattern is quite similar to that of *C. grahambelli* Forattini, described from Panama. *C. khalafi,* however, has the eyes well separated, and distal sensory tufts on flagellar segments III and VIII-X of the antennae. *C. grahambelli* has the eyes contiguous and has sensory tufts of all of the first eight flagellar segments.

I take pleasure in naming this species for Dr. Kamel Khalf in recognition of his excellent studies of this genus.

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ENTOMOLOGY IS FUN [1]

JOHN E. PORTER [2]

In contemplating the preparation of a paper for this occasion your chairman faced the prospect of alienating all semblance of tolerance which you have kindly shown during the past sixteen months. I had several alternatives: To be dull and put you to sleep immediately or have you walk out, or, to face up to the occasion and lock everyone inside.

Seriously though, I take great pride in the development our organization has made. We started from "scratch" and have now achieved branch status in the Florida Entomological Society, thus engendering state and nation-wide recognition as an "up-and-coming" group of entomologists.

We have performed two outstanding public functions and in these measures alone have justified all our activities. The enlightenment of the public with respect to the Mediterranean Fruit Fly was a service much needed and well received. It should be, perhaps, a continuing program, for as matters now stand public sentiment and apathy towards the eradication program can play long-standing harm to this or any other insect control program which may be necessary in the future.

Secondly, the attention we gave to local demands for parathion use-restrictions has solidified the requests of interested people for legislation which will be beneficial to the majority of the residents of the state. The results of this service were immediately felt through action of the State Board of Health and their Bureau of Entomology, in calling for first a conference of all interested parties and then developing their plans to formulate the legislative requirements needed.

In analysis, our branch in its entirety can and should act as a committee of public relations to encourage a wider distribution of entomological information to the public in all the ways possible.

It has been fun helping to conceive our society and slowly watch it develop into a bouncing, healthy child. Conception was planned or intentional—this was no unwanted child! I have used this term advisedly. An infant according to Webster, refers to anyone up to the age of 21. Sir Francis Bacon in an essay *Of Youth and Age* states, that "A man that is young in years may be old in hours, if he have lost no time". We have not let much grass grow under our feet, but I shall leave the determination of our development up to you.

Needless to say, all parents know that in one way or another they tend to train their children in certain ways, and encounter times when their children need advice and assistance. Thus let us digress for a few moments to the days when our own children were younger:

Our child is just out of its diapering stage (we hope)—a bit wobbly on its feet but equipped with good sound limbs and organs (especially lungs). We like the feel of the tiny hand clutching on to our big fingers, a feeling of reassurance for the child and of love and care on our part. We frequently

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[1] An address presented to the Subtropical Branch of the Florida Entomological Society, Miami, Florida on January 9, 1957, by the Chairman of the Branch.

[2] Entomologist, U. S. Quarantine Station, Miami Beach, Florida, Division of Foreign Quarantine, Public Health Service, U. S. Department of Health, Education, and Welfare.

have to feed him, being careful that the bites of food are not too large (he might gag on them). Frequently, the child gets so excited with his food that he is practically head to toes in it—but he enjoys it! Our organization is young—perhaps not too sturdy yet—but in any case a helping hand is wanted, as is nourishment. Give the organization the benefit of your assistance—feed it with ideas! If they are well received, expect your officers to get head over heels into it. Remember that the thoughts expressed by all of you will be well digested and utilized to advantage. Remember too, that as with a child, force-feeding is sometimes necessary. It wouldn't be right if at sometime in the future, as in the past, you do not demand a "force-feeding" of this group.

Recollections of our last January meeting are still fresh in my mind. I appreciate the honor you did in asking me to serve you this past year. Our original committee which served from September 1955, to January 1956, was broken with the establishment of the offices of president, vice-president and secretary-treasurer. I want at this time to thank again these men who served originally with me in forming our group. They are: Dr. F. Gray Butcher and Messrs. Robert F. Curran, James H. Heidt and Alfred S. Mills. My thanks also go to our present very fine help from Drs. Butcher and D. O. Wolfenbarger and Mr. Alfred S. Mills, who have served on this year's committee.

Tyler's Restaurant, near South Miami, proved to be an acceptable meeting place for your committees both before and after our elections in January, 1956. I remember the sessions we held this past year. They were pleasant associations for me. I hope the feeling has been mutual, and trust the functioning of the committee has met with your approval. Considering our attendance and response, I am sure we have encountered few objectors.

We always had interesting discussions at our luncheons. One question was: "What should be the requirements for membership in the Subtropical Entomologists of Florida?" Should they be based on professional interest? Age? Sex? I am sure we were all actually agreed that we wanted to encourage everyone who was at all *interested* in entomology to attend. This is, more or less, in conformity with the requirements for membership in most entomological societies. We did not, therefore, set forth any hard-and-fast rules on membership.

This *interest in entomology* then is also the prime *goal* for our organization. We must strive always to encourage our members to participate in discussions, presentations, and reports. We must sell others on our enthusiasm in the professional or avocational interests of the field. We must recognize the diverse branches of the field and the associated sciences with which these branches of entomology must play a companion role. Compliance with these aims will go a long way towards maintaining ours as a healthy and prosperous organization.

To help promote this thesis of *Interest in Entomology* I would like to discuss one phase in particular—Entomology is Fun. Basically *fun* may be expressed as anything which gives or provides pleasure to an individual. It may be in the form of *entertainment* implying thought and mental occupation in an agreeable and refreshing way. It may be in the form of *recreation* in which mental and physical occupation are involved, or in *enjoyment*—an aesthetic quality but one which, to many, provides pleasure.

The fun derived from laboring as an entomologist is great and varied. The devotion with which one delves into the science and the enthusiasm one exerts, obviously accentuate these pleasures as active participation increases the rewards in any venture or endeavor.

It is with a degree of nostalgia that I'm sure we all recall associations of earlier days when we were still studying the fundamentals of insect life in college or in the great out-of-doors. Our teachers, our course work, and our classmates all left an imprint on our future. In retrospect those days spent in high school were "just a picnic" when we were in college, and to many of us, each succeeding year is always harder than the preceding one. Yet, in all these memories a little sun shines—an unusual specimen found here, a new observation made there, friendships cemented. We have profited from the years of experience and teaching our patient leaders have given us. Ours is the reaping of the heritage of Fitch, Harris, The Comstocks, Fernald, Howard, Metcalf, of Herms and numerous other illustrious teachers. Certainly we have enjoyed knowing these men or knowing of them.

But, it is in the realm of daily living that we must seek satisfaction, or fun, in our work. We have rightly or wrongly at one time or another enjoyed "ribbing" a friend who found himself in an unusual situation. Entomologists are no exception. They, too, are often ridiculed and laughed at in cartoon and comedy. A classmate of mine once collected these cartoons as a hobby and had quite a few. How many events have *you* collected in your own career that you can look back on as being humorous? I have on my list: being threatened with arrest for trespassing; eyed as an escapee from a nearby mental institution because officers thought my insect collecting activities rather peculiar; embarrassed by an unexpected ending to an experiment in which gray kittens became greenish when dusted with a test material; and run ragged when attempting to evade a large swarm of angry hornets.

I assume that we all enjoy eating. Yet to include this pleasant occasion in a discussion of the enjoyment of certain qualities of insects is anything but pleasant or enjoyable to most of us. If we, however, were to study the staples of some of the so-called underprivileged or backward peoples of the world we would find that caterpillars, grasshoppers, and the like please them perhaps as much as a well-cooked steak would please us, making it fun to eat.

There is an inane tendency in some people to develop odd utilizations of insects to occupy their idle hours. I was interested to note that in the Orient some people gamble on crickets trained to fight. (Miami is "missing a bet".) I'm sure we have all heard of, or perhaps seen, flea circuses. Flies and other insects are sometimes used to activate various grotesque novelties, and who of us has not at one time or another attached a thread to an insect for other than a purely scientific observation?

Some of our more popular motion picture productions have capitalized on the interestingly entertaining value presented by photographic biographies of insects and other forms of wild life.

There are a number of games in which a knowledge of insects is imparted to a certain degree. These have provided fun to children and to some adults by the hour.

Our piscatorial friends and associates put considerable thought and study into making and casting flies into mountain trout streams or other likely

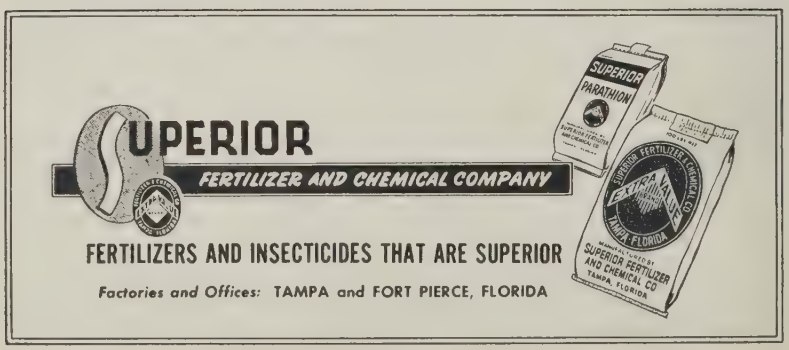
waters. Many boys receive unlimited pleasures in carefully baiting their hooks with choice entomological specimens. One of our outstanding entomologists has recently written a book on the subject.

Our daily life is made conscious of the presence of insects - - - the cicada's song, the katydid and the cricket's break of the evening silence. The limitless variety of forms and colors in insects brighten our existence. Indeed, some are considered sufficiently attractive that they are used as models for artists, milliners, and decorators. Highly colored and striking specimens are used *in toto* as adornments in trays, rings, pins, necklaces, and other types of jewelry.

We inhale the beauties of nature in our search for insect specimens. An occasional field trip is fun. Moths and butterflies are admired by all, while those who have access to lens and microscope find much to enjoy in the colors, patterns, and unusual forms of smaller insects.

I am sure that we all have a feeling of gratification when we help others. To some, this sense comes best with the imparting of knowledge or with the help needed to uncover the secrets of nature. To others, the feeling that they are helping to better a person's physical or economic condition is the answer. What can be more fun then than doing the things which encourage this sensation?

Fabré opened the world of insects to many. Lutz, Swain, and other enthusiastic teachers have been responsible for bringing the field closer to more people. Yet, how many untold thousands of boys and girls, and even adults, without knowing of these men or their works will look in awe at the structure of an insect's body, the color of a butterfly's wing or marvel at the mysteries of metamorphosis? Each observation they make sends a pulsing sensation of joy throughout their body. It is this wonder over what God has made which makes life so enjoyable for most of us who are associated in entomology. The ability of our teachers to explain these wonders clearly only points up the joy and fun we have in our daily observations of insects whether by hobby or vocation.



TWO NEW *EOTETRANYCHUS* AND A NEW *OLIGONYCHUS* FROM SOUTHERN FLORIDA (ACARINA: TETRANYCHIDAE)

Donald De Leon
Coral Gables, Florida

The mites described below are all fairly common species in this area.

Eotetranychus tremae, n. sp.
(Figs. 1-4)

In the key to the species by Pritchard and Baker[1] *E. tremae* runs to *hicoriae* (McG.) but the female differs from McGregor's drawings and description[2] of *hicoriae* in that the peritreme ends in a shorter hook, and the male in that the distal part of the aedeagus is long, tapering, nearly straight, and forms about a right angle with the proximal part.

Female: Grayish white with two pairs of blackish spots at sides of hysterosoma—one pair at humeral angle, the other about half way to end of body; dorsal body setae slender, tapering to apex and each longer than distance to seta next behind; peritreme ending in short hook. Terminal palpal sensilla large and about twice as long as wide, subterminal sensilla much smaller. Tibia I with one sensory and nine tactile setae, tarsus I with one sensory and five (sometimes four) tactile setae proximal to duplexes; tibia II with eight tactile setae, tarsus II with one sensory and three (sometimes two) tactile setae proximal to duplexes; tibia III with six tactile setae. Genital flap with transverse striae, area just anterior to it with longitudinal striae. Length of body including gnathosoma 350, width 183 microns.

Male: Similar to female in colour, shape of peritreme, and body setae. Terminal sensilla of palpus almost conical, slightly more than twice as long as wide at base, subterminal sensilla somewhat longer than terminal. Tibia I with nine tactile and three (sometimes four) sensory setae, tarsus I with four (sometimes three) tactile and three sensory setae proximal to duplexes; tibia II with eight tactile setae, tarsus II with one sensory and three tactile setae proximal to duplexes. Aedeagus with distal part directed ventrad, long and tapering and forming about a right angle with basal part. Length of body including gnathosoma 261, width 120 microns.

Holotype: Male, Coral Gables, Florida, 22 May, 1956, (D. De Leon) on *Trema floridana*. Paratypes: 15 males, 25 females, 12 nymphs, and 2 larvae, 22 November, 1955, to 22 May, 1956; other collection data same as for holotype.

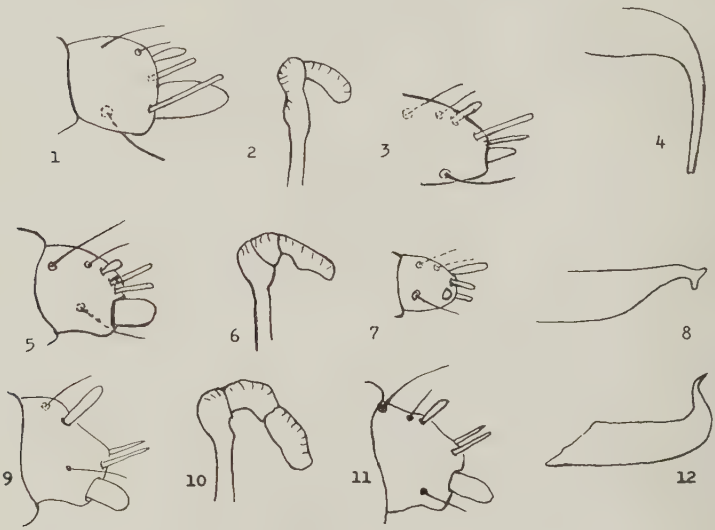
Eotetranychus mastichi, n. sp.
(Figs. 5-8)

E. mastichi runs to *perplexus* (McGregor) from the Pacific Coast in the key by Pritchard and Baker, but the male differs from McGregor's

[1] Pritchard, A. E. and E. W. Baker. 1955. A revision of the spider mite family Tetranychidae. Pac. Coast Ent. Soc. Memoir 2, 472p.

[2] McGregor, E. A. 1950. Mites of the family Tetranychidae. Amer. Midl. Nat. 44 (2): 257-420.

drawings of *perplexus* (op. cit.) in that the outline of the distal end of the aedeagus is concave and its general shape is different, and the female differs from McGregor's description in that tarsus I bears four tactile setae proximal of the duplexes.



Explanation of Figures.

Figs. 1 to 4. *Eotetranychus tremae*, n. sp. Terminal palpal segment of female, distal end of peritreme of female, terminal palpal segment of male, aedeagus.

Figs. 5 to 8. *E. mastichi*, n. sp. Parts in same order as for *tremae*.

Figs. 9 to 12. *Oligonychus plicarum*, n. sp. Parts in same order as for *E. tremae*.

FEMALE: Pearly white to grayish in colour with two pairs of blackish spots at sides of hysterosoma and with a blackish band connecting anterior pair; dorsal body setae slender, tapering to apex, each longer than distance to seta next behind; peritreme terminating distad in a short right-angled to J-shaped hook. Terminal palpal sensilla of moderate size and about three-fifths as wide as long, subterminal sensilla much smaller. Tibia I with one sensory and nine tactile setae, tarsus I with four (rarely five) tactile setae (and rarely one sensory seta) proximal of duplexes; tibia II with eight tactile setae, tarsus II with one tactile and one sensory seta proximal of duplexes, tibia III with six tactile setae. Genital flap and area just anterior to it with transverse striae. Length of body including gnathosoma 363, width 208 microns.

MALE: Cream to pale orange in colour; dorsal body setae similar to those of female's. Terminal sensilla of palpus rudimentary, subterminal sensilla about three times as long as wide. Peritreme terminating distad

as a short right-angled to J-shaped hook. Tibia I with one sensory and nine tactile setae, tarsus I with four tactile and two (sometimes one) sensory setae proximal of duplexes; tibia II with eight tactile setae, tarsus II with one tactile and one sensory seta (sometimes no tactile and two sensory setae) proximal of duplexes. Aedeagus ending in a knob with dorsal and ventral angles, the outline of end concave. Length of body including gnathosoma 300 microns, width 152.

Holotype: Male, Coral Gables, Florida, 29 November, 1955, (D. De Leon), on *Sideroxylon foetidissimum*. Paratypes: 28 males, 32 females, 21 nymphs, and 12 larvae, 8 November, 1955, to 8 May, 1956; other collection data same as for holotype.

Oligonychus plicarum, n. sp.
(Figs. 9-12)

The male of *O. plicarum* runs to *indicus* in the key to the species by Pritchard and Baker (*op. cit.*) but the peritremes are retrorse distad; the male is also distinctive in the shape of the aedeagus and in several other characters.

Female: Yellowish orange, often with darker orange markings at sides of hysterosoma; dorsal body setae slender, tapering to apex, each longer than distance to seta next behind; peritremes retrorse distad. Terminal palpal sensilla about once and a half as long as wide, subterminal sensilla about four times as long as wide, slightly longer than terminal sensilla. Tibia I with one sensory and nine tactile setae, tarsus I with four tactile setae (a sensory seta usually in line with proximal duplexes, but sometimes slightly proximal of them) proximal of proximal set of duplexes; tibia II with seven tactile setae, tarsus II with one sensory and two tactile setae, tibia III with six tactile setae. Hysterosomal striae in mid-dorsal area more or less transverse, except between anterior pair of sacrals where they are usually longitudinal. Length of body including gnathosoma 465, width 216 microns.

Male: Similar to female, but usually rather hyaline. Terminal sensilla of palpus not quite twice as long as wide, subterminal sensilla smaller than terminal sensilla. Tibia I with two sensory and nine tactile setae, tarsus I with two sensory and four tactile setae proximal of duplexes, two ventral tactile setae distal of duplexes, proximoventral setae of empodium forming a broad, sharply pointed spur considerably larger than distal part of empodium; tibia II with seven tactile setae, tarsus II with one sensory and two tactile setae proximal of duplexes, tibia III with six tactile setae. Aedeagus with caudal part bent dorsad at about a right angle to shaft; distal part without a knob, tapering rapidly to a point and directed caudodorsad. Length of body including gnathosoma 416, width 177 microns.

Holotype: Male, Coral Gables, Florida, 23 July, 1956, (D. De Leon) from *Serenoa repens*. Paratypes: 14 females, 2 males, 1 nymph, 2 larvae, 20 April, 1955, from *Sabal palmetto* and 7 males, 16 females, 2 nymphs, 2 larvae, 23 July, 1956, from *Serenoa repens*.

Paratypes of these three species will be deposited in the University of Florida Collections, Gainesville.

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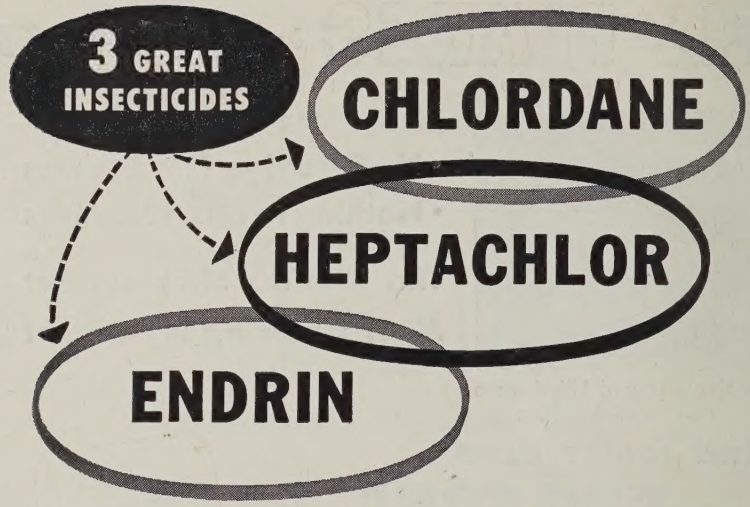

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ENDRIN: Budworms, Cabbage Worms, Cotton Boll Weevil, Cotton Bollworm, Cotton Fleahopper, Fall Armyworm, Grasshoppers, Hornworms, Leafworms, Rapid Plant Bug, Spiny Bollworm, Sugar Beet Webworm, Tarnished Plant Bug, Thrips.

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